

REMARKS

Claims 9 to 12 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claims 9 to 12 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claims 9 to 12 were rejected under 35 U.S.C. §112, first paragraph, as based on a disclosure which is not enabling. Claims 9 to 12 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements. Claims 5 to 12 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9 to 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over EP. Patent No. 0 533 073 to Van Swam et al. (hereinafter "Van Swam") in view of either one of U.S. Patent 5,289,513 to De Mario et al. (hereinafter "De Mario") or U.S. Patent 4,309,250 to Bradley (hereinafter "Bradley").

Claim 5 has been amended to change the transitional term "containing" to "consisting essentially of" to be consistent with the product claim. Claim 5 has also been amended to recite "an outside portion of the cladding" instead of "the outside portion of the cladding" to correct the antecedent basis.

Claim 9 has been amended to recite "an outside portion of the cladding" instead of "the outside portion of the cladding" to correct the antecedent basis.

Claims 5 to 12 are currently pending in the present application.

Reconsideration of the present application based on the foregoing amendments and the following remarks is respectfully requested.

§112 Rejections

Claims 9 to 12 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

The Office Action asserts on page 3 that the "produced tube is of a different elemental composition from the original bar because 'comprising' is different from 'consisting essentially of.'" Claim 5 has been amended to recite "consisting essentially of." Therefore the produced tube and the original bar have the same elemental composition.

Withdrawal of the rejection to claims 9 and 12 is respectfully requested.

Claims 9 to 12 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The Office Action asserts on page 4 that the “new matter pertains to a tube having an elemental composition that is different from the elemental composition of a bar used to manufacture this tube.” Claim 5 has been amended to recite “consisting essentially of.” Therefore the produced tube and the original bar have the same elemental composition.

Withdrawal of the rejection to claims 9 and 12 is respectfully requested.

Claims 9 to 12 were rejected under 35 U.S.C. §112, first paragraph, as based on a disclosure which is not enabling.

The Office Action asserts on page 4 that the “elements or conditions that cause the product to have a different elemental composition from the elemental composition of the original bar, which is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled in the disclosure.” Claim 5 has been amended to recite “consisting essentially of.” Therefore the produced tube and the original bar have the same elemental composition.

Withdrawal of the rejection to claims 9 and 12 is respectfully requested.

Claims 9 to 12 were rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements.

The Office Action asserts on page 4 that the “omitted elements or conditions that cause the product to have a different elemental composition from the elemental composition of the original bar.” Claim 5 has been amended to recite “consisting essentially of.” Therefore the produced tube and the original bar have the same elemental composition and no omitted elements or conditions that cause the product to have a different composition exist.

Withdrawal of the rejection to claims 9 and 12 is respectfully requested.

Claims 5 to 12 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Office Action asserts on page 4 that there is insufficient antecedent basis for the limitation "the outside portion of cladding" in claims 5 and 9. Claims 5 and 9 have been amended to correct the antecedent basis.

Withdrawal of the rejection to claims 5 to 12 is respectfully requested.

§103 Rejections

Claims 9 to 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Van Swan in view of either one De Mario or Bradley.

Van Swan discloses a nuclear reactor fuel assembly having an inner layer composed of "zirconium alloys with a about 0-2% tin, 0-10% niobium, 0-0.5% Fe, 0-0.2% Cr, 0-0.2% Ni, 0.05%-0.20% oxygen and small amounts of impurities as may be typically encountered in nuclear grade zirconium sponge." (Col. 3, lines 35 to 40). The impurities include Aluminum, Boron, Cadmium, Carbon, Chromium, Cobalt, Copper, Hafnium Iron, Hydrogen, Oxygen, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Silicon, Tin, Titanium, Tungsten, and Uranium. (Col. 3, lines 41 to 53).

DeMario discloses a method of making a fuel assembly lattice member and the lattice member made by such method. The fuel assembly contains multiple fuel rods, each fuel rod having a cladding. "Cladding 30 has an inside diameter 50 and an outside diameter 60 and may be any suitable metal, such as ZIRCALOY 4, or the like, having a relatively small microscopic absorption cross section for neutrons in order to reduce parasitic absorption of the neutrons." (Col. 4, lines 38 to 45).

Bradley discloses a between cycle laser system for depressurization and resealing of modified design nuclear fuel assembly.

Claim 9 recites "[a] tube for constituting all or an outside portion of cladding for a nuclear fuel rod or of a guide tube for a nuclear fuel assembly, made of zirconium-base alloy consisting essentially of:

- 0.8 % wt. to 1.8% wt. niobium,
- 0.2% wt. to 0.6% wt. tin,
- 0.02 % wt. to 0.4% wt. iron, plus inevitable impurities,
- a carbon content controlled to lie in the range 30 ppm to 180-ppm,
- a silicon content in the range 10 ppm to 120 ppm, and

an oxygen content in the range 600 ppm to 1800 ppm, with the balance zirconium."

Van Swam, De Mario and Bradley fail to teach or show “zirconium-base alloy consisting essentially of: 0.8 % wt. to 1.8% wt. niobium, 0.2% wt. to 0.6% wt. tin, 0.02 % wt. to 0.4% wt. iron, plus inevitable impurities, a carbon content controlled to lie in the range 30 ppm to 180-ppm, a silicon content in the range 10 ppm to 120 ppm, and an oxygen content in the range 600 ppm to 1800 ppm, with the balance zirconium,” as recited in claim 9. The Office Action admits on page 6 that Van Swam fails to teach “including only the cited elements and excluding any other unspecified element.” The Office Action asserts on page 6 that the combination of Van Swam and the teaching of either De Mario or Bradley would have been obvious to reduce parasitic neutron absorptions because “such modification is no more than the use of a well known expedient within the nuclear art.” The Office Action further asserts “the artisan would have recognized that parasitic neutron absorptions can be minimized by not including elements in the Van Swam alloy that are not needed to achieve the desired strength and creep properties.” However, there is simply no factual basis or evidence, as required by MPEP 2141, for the Examiner’s obviousness assertions. Neither De Mario nor Bradley provide any reason or motivation to modify Van Swam as explicitly claimed. De Mario fails to provide any teaching or motivation that any elements cited in De Mario either contribute to limit this neutronic absorption if it is totally or partially suppressed from, or added, to any zirconium alloy in particular, or specifically from the alloy of Van Swam. Bradley also fails to teach reduction of parasitic neutron absorptions is accomplished by the exclusion of elements. Bradley merely teaches lowering the neutronic absorption of a fuel cladding by lowering of the thickness of the cladding. There is no factual basis or reason that one of skill in the art would find it obvious to modify Van Swam to the explicit elements as claimed based on De Mario or Bradley, as required by the Guidelines.

As clearly stated in MPEP 2141:

Office personnel fulfill the critical role of factfinder when resolving the Graham inquiries. It must be remembered that while the ultimate determination of obviousness is a legal conclusion, the underlying Graham inquiries are factual. When making an obviousness rejection, Office personnel must therefore ensure that the written record includes findings of fact concerning the state of the art and the teachings of the references applied. In certain circumstances, it may also be important to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done. *Factual findings made by Office personnel are the*

necessary underpinnings to establish obviousness.
(emphasis added.)

There is simply no *factual* basis for stating that “the artisan would have recognized that parasitic neutron absorptions can be minimized by not including elements in the Van Swam alloy that are not needed to achieve the desired strength and creep properties.”

Moreover, Van Swam teaches away from being modified to the present invention. The purpose of Van Swam is to provide a good compromise between all kinds of resistance to corrosion. Van Swam states “[a]lloys containing niobium are also preferred as they have shown increased resistance to modular corrosion frequently observed in water cooled reactors.” (Col. 4, lines 19 to 22). Restricting Van Swam to the explicitly cited elements would remove significant amounts of Ni and Cr which would be against the teaching of Van Swam.

Withdrawal of the rejection to claims 9 to 12 is respectfully requested.

CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,

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